

## Ocean Planner: A Web-Based Decision Aid to Design Measures to Best Mitigate Underwater Noise

**Authors :** Thomas Folegot, Arnaud Levaufre, Léna Bourven, Nicolas Kermagoret, Alexis Caillard, Roger Gallou

**Abstract :** Concern for negative impacts of anthropogenic noise on the ocean's ecosystems has increased over the recent decades. This concern leads to a similar increased willingness to regulate noise-generating activities, of which shipping is one of the most significant. Dealing with ship noise requires not only knowledge about the noise from individual ships, but also how the ship noise is distributed in time and space within the habitats of concern. Marine mammals, but also fish, sea turtles, larvae and invertebrates are mostly dependent on the sounds they use to hunt, feed, avoid predators, during reproduction to socialize and communicate, or to defend a territory. In the marine environment, sight is only useful up to a few tens of meters, whereas sound can propagate over hundreds or even thousands of kilometers. Directive 2008/56/EC of the European Parliament and of the Council of June 17, 2008 called the Marine Strategy Framework Directive (MSFD) require the Member States of the European Union to take the necessary measures to reduce the impacts of maritime activities to achieve and maintain a good environmental status of the marine environment. The Ocean-Planner is a web-based platform that provides to regulators, managers of protected or sensitive areas, etc. with a decision support tool that enable to anticipate and quantify the effectiveness of management measures in terms of reduction or modification the distribution of underwater noise, in response to Descriptor 11 of the MSFD and to the Marine Spatial Planning Directive. Based on the operational sound modelling tool Quonops Online Service, Ocean-Planner allows the user via an intuitive geographical interface to define management measures at local (Marine Protected Area, Natura 2000 sites, Harbors, etc.) or global (Particularly Sensitive Sea Area) scales, seasonal (regulation over a period of time) or permanent, partial (focused to some maritime activities) or complete (all maritime activities), etc. Speed limit, exclusion area, traffic separation scheme (TSS), and vessel sound level limitation are among the measures supported by the tool. Ocean Planner help to decide on the most effective measure to apply to maintain or restore the biodiversity and the functioning of the ecosystems of the coastal seabed, maintain a good state of conservation of sensitive areas and maintain or restore the populations of marine species.

**Keywords :** underwater noise, marine biodiversity, marine spatial planning, mitigation measures, prediction

**Conference Title :** ICCMSP 2023 : International Conference on Coastal and Marine Spatial Planning

**Conference Location :** Paris, France

**Conference Dates :** August 24-25, 2023